

Translation

PATENT COOPERATION TREATY

PCT/EP2003/009748



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 02062WO/Sa	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/009748	International filing date (day/month/year) 02 September 2003 (02.09.2003)	Priority date (day/month/year) 06 September 2002 (06.09.2002)
International Patent Classification (IPC) or national classification and IPC C04B 35/576		
Applicant CERAMTEC AG INNOVATIVE CERAMIC ENGINEERING		

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1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.	
2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet.	
<input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).	
These annexes consist of a total of <u>6</u> sheets.	
3. This report contains indications relating to the following items:	
I	<input checked="" type="checkbox"/> Basis of the report
II	<input type="checkbox"/> Priority
III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	<input type="checkbox"/> Lack of unity of invention
V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	<input type="checkbox"/> Certain documents cited
VII	<input type="checkbox"/> Certain defects in the international application
VIII	<input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 01 April 2004 (01.04.2004)	Date of completion of this report 02 February 2005 (02.02.2005)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/009748

## I. Basis of the report

### 1. With regard to the elements of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_ 2, 2a \_\_\_\_\_, filed with the letter of \_\_\_\_\_ 15 December 2004 (15.12.2004)
- ☒ the claims:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, as amended (together with any statement under Article 19  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_ 1-12 \_\_\_\_\_, filed with the letter of \_\_\_\_\_ 15 December 2004 (15.12.2004)
- ☒ the drawings:  
 pages \_\_\_\_\_ 1-4 \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
 pages \_\_\_\_\_, as originally filed  
 pages \_\_\_\_\_, filed with the demand  
 pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

### 2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

### 3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

### 4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, Nos. \_\_\_\_\_ 13 \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

### 5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

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## I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*

### 1. Amendments submitted (PCT Article 34(2)(b))

a. The applicant has incorporated original claim 9 into claim 1. The original claim 9, however, refers to claim 7 or 8, and the original claim 7 refers to claim 6, which, in turn, refers to claims 1-5. This means that the original application disclosed the features of claim 9 only in combination with the features of at least claims 7, 6 and 1 taken together. The original application did not disclose the features of claim 9 only in combination with claim 1. Therefore, the original claim 9 can be incorporated into the original claim 1 only if the original claims 6 and 7 are also incorporated into the original claim 1.

Consequently, PCT Article 34(2)(b) has been contravened.

b. The original claims 9 and 10 mention only a diameter rather than a nominal diameter. Therefore, the addition of "nominal" in the new claim 9 contravenes PCT Article 34(2)(b).

c. The original claims 12 and 13 do not refer to the original claim 11. Therefore, the current reference of claims 11 and 12 to claim 10 contravenes PCT Article 34(2)(b).

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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	3, 4, 12	YES
	Claims	1, 2, 5-11	NO
Inventive step (IS)	Claims		YES
	Claims	1-12	NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims		NO

## 2. Citations and explanations

This report makes reference to the following documents:

D1: US-A-5 080 378 (KAGAWA FUMIO) 14 January 1992  
(1992-01-14)

D2: EP-A-0 486 336 (CERAMIQUES COMPOSITES) 20 May  
1992 (1992-05-20), mentioned in the  
application

D3: EP-A-0 578 408 (CARBORUNDUM CO) 12 January  
1994 (1994-01-12), mentioned in the  
application.

## 2. Novelty (PCT Article 33(2))

a. Lines 4-8 in column 3 of D1 mention a sintered silicon carbide body with a porosity of 4-13 percent by volume and independent, and therefore closed, pores with an average diameter of 10-40 micrometers. Lines 32-36 of column 4 indicate that the pores should be spherical. Furthermore, lines 34-36 of column 3 mention that  $\alpha$ -SiC is preferable.

In general, these bodies have been obtained by mixing spherical polymer opening materials with a suspension of inorganic raw materials (column 4, lines 55-68). Example 1 shows that the porosification agent in the suspension of inorganic and organic raw material components is dispersed

and thoroughly baked, after shaping, by means of sintering.

The opening materials are mentioned in Table 1. Table 1 shows that the polystyrene spheres in examples 1-6 have a "grain diameter" of 10, 20, 30 or 40 micrometers. "Grain diameter" means particle size. Therefore, each of these examples relates to spheres with a very narrow size distribution that clearly have only the size indicated in Table 1. The pore diameter of the sintered molded body indicated in Table 1 is, as the applicant indicated in the letter of 15 December 2004, in fact an average pore diameter. As Table 1 indicates, the average size of the pores in each example is equal to the size of the baked polystyrene spheres. Since the polystyrene spheres have a very narrow size distribution, it can be assumed that the size distribution of the pores in the sintered molded body is also narrow. Certainly in the case of example 5, in which spheres with a size of 30 micrometers are used, it can be assumed all of the pores in the sintered molded body are greater than 15 micrometers and less than 45 micrometers in size.

The present application does not meet the requirements of PCT Article 33(1) with respect to D1, because the subject matter of claims 1, 2 and 5-11 lacks novelty within the meaning of PCT Article 33(2).

b. The applicant's attention is drawn to the fact that none of the features of the original claims 6-10 is a product feature that can be used to restrict claim 1. All of the features of these claims are method features that indicate nothing with respect to the final product claimed in claim 1.

**3. Inventive step (PCT Article 33(3))**

a. D1 is regarded as the prior art closest to the subject matter of claims 3 and 4. The sintered molded body of claims 3 and 4 differs from the sintered molded body of D1 in that it contains a small quantity of **elemental boron**. The sintered molded body of claims 3 and 4 does not necessarily contain borides and/or silicides, because the quantity of hard material can be 0%. The presence of the hard material is therefore optional. The compositions of claims 3 and 4 refer to the **sintered** molded body rather than to the final powder.

Therefore, the line of reasoning presented by the applicant in the letter of 15 December 2004, in which he claims that the molded body of claims 3 and 4 contains boron carbide, is incorrect. The applicant would have had to present arguments explaining why it would be advantageous to have elemental boron in the sintered molded body. The applicant did not provide any such arguments. Furthermore, a person skilled in the art knows that the addition of hard materials such as boron carbide increases the resistance to wear of ceramic materials.

b. The difference between the present claim 12 of the application and the closest prior art, D1, is that the porosification material is not added to the ceramic powder mixture until after drying. The applicant did not provide any good reasons indicating why such a procedure would be advantageous. Deforming forces that affect the polymer spheres occur in both dry and wet grinding. These forces are unavoidable in both cases, but they appear to be greater in drying grinding. Furthermore, it is more difficult to obtain a homogenous mixture when dry grinding. In order to achieve the same homogeneity during dry grinding, normally greater forces have to act on the

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particles than in wet grinding. Therefore the risk of deforming the spheres is greater in dry grinding.

Consequently, wet grinding appears to be more advantageous.

As a result, owing to the disclosure of D1, the present application does not meet the requirements of PCT Article 33(1) because the subject matter of claims 1-12 is not inventive within the meaning of PCT Article 33(3).

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**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**4. Clarity (PCT Article 6)**

Claims 3 and 4 lack clarity because the applicant failed to delete the word "of" in the second line of claim 3 and claim 4. A material does not contain of something, it contains something or consists of something.